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EXAMINER	
RASHID, DAVID	

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2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/527,862	NOBLE ET AL.	
	Examiner	Art Unit	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 13-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 13-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

Amendments & Claim Status 2
Claim Rejections - 35 U.S.C. § 101 2
In Re Bilski – "Tied To" Criteria and/or Qualifying "Transformation" 2
Claim Rejections - 35 U.S.C. § 102 3
Malassiotis et al. 4
Claim Rejections - 35 U.S.C. § 103 7
Malassiotis et al. in view of Qian 7
Allowable Subject Matter 8
Conclusion 8

Amendments & Claim Status

[1] This office action is responsive to Amendment received Apr. 7, 2009. Claims 1-6 and 13-22 remain pending; claims 11-12 cancelled; claim 22 new.

Claim Rejections - 35 U.S.C. § 101

[2] 35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

In Re Bilski – "Tied To" Criteria and/or Qualifying "Transformation"

[3] **Claims 13** and **15-22** are rejected under 35 U.S.C. § 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. § 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter

[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

With regard to (1) above, a process must have either a meaningful tie to an "apparatus", or "machine", or the process must perform a qualifying transformation. Insignificant pre- or post-solution activity involving an "apparatus" or "machine" is not a meaningful tie. In addition, when such machine is introduced and significant to the inventive concept, it must be a particular machine (e.g., a "processor", not a "machine"). For example, claims 17 and 22 are directed to at least one of storing the second segmenting image and displaying the second segmented image on a monitor which is post-processing activity. Claim 22 cites "[a] method for segmenting a series of 2D or 3D images obtained from a target object within a patient" which is intended-use activity.

With regard to (2) above, the images in claim 1 do not represent a physical object transformed prior to (other than the intended use statement of claim 22 "for segmenting a series of 2D or 3D images obtained from a target object within a patient". In addition any post solution activity such as storing or displaying would have to indicate what physical elements the image is stored or displayed on to possibly indicate physical transformation. It is suggested that to satisfy (2), positively recite a method-step directed to "segmenting a series of 2D or 3D images obtained from a target object within a patient" (and not intended-use).

Claims 13, 15-16 and 18-21 are rejected for failing to alleviate the rejection of their respective dependents.

Claim Rejections - 35 U.S.C. § 102

[4] The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted

on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Malassiotis et al.

[5] **Claims 1-3, 5-6, 13, 15-17,** and **20-22** are rejected under 35 U.S.C. 102(b) as being anticipated by Tracking the Left Ventricle in Echocardiographic Images by Learning Heart Dynamics, IEEE Transactions on Medical Imaging, Vol. 18, No. 3, 3/1999, pp. 282 – 290 (published March 1999, hereinafter "Malassiotis et al.").

Regarding **claim 1**, Malassiotis et al. discloses an apparatus (the computer used to perform the steps) for segmenting a series of 2D (p. 287) or 3D images obtained from a target object within a patient ("heart ventricle" at section I, left column, p. 282) comprising:

a transform calculator (the computer used to perform the steps) which calculates a series of transformations (e.g., the transformations at fig. 7a-d; fig. 3, p. 285 wherein the transformation switching from the old set to the new set of snake points using contour tracking), wherein each transformation comprises an operation ("contour tracking" at p. 285 incorporating section IV(B) at p. 285) for defining a best fit (fig. 4c has the best match ratio; best fit in terms of finding the optimal contour track segmentation between two images) between two images (e.g., fig. 7b-c) of a first series of images (fig. 7a-d), a first transformation (the contour tracking segmentation between fig. 7b-c) of the series of transformations (e.g., the transformations at fig. 7a-d) being between a first of the two images (fig. 7b) and a subsequent one of the two images (fig. 7c);

a segmenter (the computer used to perform the steps) by which a segmentation of the first image of the first series (fig. 7b is segmented; section III at p. 283) is generated; and

an image converter (the computer used to perform the steps) which transforms (e.g., fig. 3 depicts transforming the segmentation of the first transformation (dotted curve) to produce the transformed segmentation (solid curve)) the segmentation with the first transformation (the contour tracking segmentation between fig. 7b-c) and applies the transformed segmentation (solid curves at fig. 3) to said subsequent one of the two images (fig. 7c).

Regarding **claim 2**, Malassiotis et al. discloses wherein each transformation (e.g., the transformations at fig. 7a-d) relates one of the first series of images to an adjacent one of the images (e.g., fig. 7b relates to fig. 7c-f because the segmentations rely on the previous segmentation) of the first series of images.

Regarding **claim 3**, Malassiotis et al. discloses wherein the segmentation of the first series of images (fig. 7a-d) is applied to a second series of images (fig. 7e-f).

Regarding **claim 5**, Malassiotis et al. discloses wherein the first (fig. 7a-d) and second series of images (fig. 7e-f) are collected at different times (the image is successive in time and thus the second series must proceed the first; and thus collected at different times, the second series being collected after the first).

Regarding **claim 6**, Malassiotis et al. discloses apparatus according to claim 1, wherein the images relate to a sphere-like organ (e.g., the heart) and prior to establishing the first series of transformations (fig. 7a-d), the first series of images is converted to a modified first series of images (fig. 7a through fig. 5f is a series of images is a modified series of images in that it was taken from an original series of images using ellipse-detection as shown in fig. 1, and prior to active contour algorithm in fig. 7) showing walls of the organ in a flat plane the contours from the segmentation is an outline attempt of the wall of a heart in a flat plane) wherein opposing sides of said plane correspond to an inside and an outside of said organ (the contours from the segmentation is an outline of the heart from which both an outside and inside exist on either side), and that the said series of transformations (fig. 7a-d) are applied to the first modified series of images (e.g., fig. 1 ellipse-detection is needed prior to the segmentation using active contour in 7a through fig. 7f).

Regarding **claim 13**, claim 3 recites identical features as in claim 13. Thus, references/arguments equivalent to those presented above for claim 3 are equally applicable to claim 13.

Regarding **claim 15**, claim 5 recites identical features as in claim 15. Thus, references/arguments equivalent to those presented above for claim 5 are equally applicable to claim 15.

Regarding **claim 16**, claim 6 recites identical features as in claim 16. Thus, references/arguments equivalent to those presented above for claim 6 are equally applicable to claim 16.

Regarding **claim 17**, Malassiotis et al. discloses a method for segmenting a series of 2D (p. 287) or 3D images, the method comprising:

calculating a transformation (e.g., the transformations at fig. 7a-d; fig. 3, p. 285 wherein the transformation switching from the old set to the new set of snake points using contour tracking) between a first image (e.g., fig. 7b before segmentation) and a second image (fig. 7c before segmentation) of a series of images (fig. 7a-f) to determine a first transformation (the active contour transformation between fig. 7b and 7c) of a series of transformations (the transformation between images at fig. 7a-f) that best fits the first image (fig. 7b before segmentation) and the second image (fig. 7c before segmentation);

performing a first segmentation (section III at p. 283) of the first image (fig. 7b before segmentation) of the series of images (fig. 7a-f) to obtain a first segmented image (fig. 7b) according to a selected segmentation process (e.g., fig. 2 estimation of snake points);

applying the first transformation (the active contour transformation between fig. 7b and 7c) to the first segmented image (fig. 7b) to generate a second segmented image (fig. 7c) corresponding to the second image (fig. 7c before segmentation); and

at least one of storing the second segmented image (fig. 7c) and displaying the second segmented image on a monitor (it is inherent fig. 7c is displayed on a monitor; section V. at p. 286).

Regarding **claim 20**, Malassiotis et al. discloses further comprising:

calculating a series of the transformations (fig. 7a-d) among the series of images (fig. 7a through fig. 5f is a series of images is a modified series of images in that it was taken from an original series of images using ellipse-detection as shown in fig. 1, and prior to active contour algorithm in fig. 7) showing walls of the organ in a flat plane the contours from the segmentation is an outline attempt of the wall of a heart in a flat plane) prior to segmenting the first image,

wherein each image of the series of images comprises a wall of an organ (e.g., the heart) in a flat plane, opposing sides of the wall respectively corresponding to inside and outside the

organ (the contours from the segmentation is an outline of the heart from which both an outside and inside exist on either side).

Regarding **claim 21**, Malassiotis et al. discloses further including resampling (resampling occurs from fig. 5 to fig. 7).

Regarding **claim 22**, Malassiotis et al. discloses a method for segmenting a series of 2D (p. 287) or 3D images obtained from a target object within a patient, the method comprising:

calculating a series of transformations (e.g., the transformations at fig. 7a-d; fig. 3, p. 285 wherein the transformation switching from the old set to the new set of snake points using contour tracking) in relation to a first series of images (fig. 7a-f), each transformation of the series of transformations relating two image (a first image (e.g., fig. 7b before segmentation) and a second image (fig. 7c before segmentation)) of the first series of images to each other;

performing a segmentation (section III at p. 283; fig. 2 estimation of snake points) on one image (fig. 7b before segmentation) of the first series of images to obtain a first segmented image (fig. 7b);

applying to the segmentation one of the transformations which relates the one image (fig. 7b before segmentation) to a subsequent image (fig. 7c before segmentation) and applying the transformed segmentation (e.g., the transformations at fig. 7a-d; fig. 3, p. 285 wherein the transformation switching from the old set to the new set of snake points using contour tracking) to said subsequent image (fig. 7c before segmentation); and

at least one of storing the subsequent image and displaying the subsequent image (it is inherent fig. 7c is displayed on a monitor; section V. at p. 286).

Claim Rejections - 35 U.S.C. § 103

[6] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Malassiotis et al. in view of Qian

[7] **Claims 4** and **14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Malassiotis et al. in view of U.S. Patent No. 5,381,791 (issued Jan. 17, 1995, hereinafter "Qian").

Regarding **claim 4**, while Malassiotis et al. discloses an apparatus according to claim 4, wherein each of the first and second series of images are each collected with ultrasound (US) means (p. 287), Malassiotis et al. does not teach the series of images collected from one of means of monitoring selected from a group magnetic resonance (MR), computed tomography (CT), and nuclear medicine (NM).

Qian teaches automatic identification of anatomical features of interest that includes a series of images each collected from one of means of monitoring selected from a group magnetic resonance (MR), computed tomography (CT), and nuclear medicine (NM) (1:10-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Malassiotis et al. to include series of images each collected from one of means of monitoring selected from a group magnetic resonance (MR), computed tomography (CT), and nuclear medicine (NM) as taught by Qian as CT and MR "produce clearly defined images" and NM "to provide method and apparatus which can automatically identify anatomic landmarks in nuclear medicine images, even when the images contain insufficient data to be diagnostically useful." Qian at 1:16-17, 2:7-11.

Regarding **claim 14**, claim 4 recites identical features as in claim 14. Thus, references/arguments equivalent to those presented above for claim 4 are equally applicable to claim 14.

Allowable Subject Matter

[8] **Claims 18-19** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 101 set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

[9] Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

[10] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578 and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
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